

Application No. 10/676,267
Amendment under 37 CFR 1.111
Reply to Office Action dated November 3, 2004
February 3, 2005

AMENDMENTS TO THE SPECIFICATION

Please substitute the paragraph beginning on page 9, line 7 and ending at line 13 to read as follows:

A nitride semiconductor element according to the present invention comprises at least a p-type nitride semiconductor layer, and an electrode including at least rhodium (Rh) and iridium (Ir) is formed on the p-type nitride semiconductor layer as schematically shown in Fig. 1 and described in further detail later.

Please substitute the paragraph beginning on page 18, line 23 and ending at page 19, line 10 to read as follows:

The details of each component and process of the present invention will be described in the following with reference to FIGS. 2 to 4. The substrate 1 only has to be a substrate capable of forming a nitride semiconductor by epitaxial growth. The substrate may be an insulating substrate such as sapphire having either c-face, r-face, or a-face as a principle surface, or spinel (MgAl_2O_4), silicon carbide (6H, 4H, 3C), silicon, ZnS, ZnO,

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Si, GaAs, diamond, or an oxide substrate which lattice matches with a nitride semiconductor such as lithium niobate and neodium gallate, and the like.

Please substitute the paragraph beginning on page 37, line 3 and ending at line 12 to read as follows:

In the embodiment 1, as shown in FIG. 5, the electrode forming face of the nitride semiconductor layer is made to the light extract face, however, the substrate side can be also made to the light extract face in the embodiment 2 ~~(FIG. 5)~~. A face-down structure is employed where the protective film 13 is formed on the nitride semiconductor except for the face on which the electrode is disposed, and a metallizing layer (bump) 14, other than using a wire, is disposed for connecting to the external electrode etc.

Please substitute the paragraph beginning on page 38, line 1 and ending at line 6 to read as follows:

Moreover, as shown in FIGS. 6C and 7, each of the p-pad electrode and/or the n-electrode is extended in a branch-shape in

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the side-face direction that respectively facing ~~(FIGs. 6C and 7)~~. By this construction, a high current can be applied uniformly even to the nitride semiconductor device of 1 mm² and greater.

Please substitute the paragraph beginning on page 54, line 3 and ending at line 9 to read as follows:

After annealing, the wafer is removed from the reaction vessel, and etching is carried out from the p-side contact side. Then, W is laminated on the exposed n-side contact layer to the thickness of 100 angstroms and Al is laminated thereon to the thickness of 1000 angstroms. Thus, an n-electrode made of [[W/A]] W/Al is formed.

Please substitute the paragraph beginning on page 55, line 5 and ending at line 21 to read as follows:

The specific contact resistivity between the p-type nitride semiconductor layer and Rh/Ir was measured by using the TLM technique and compared to the specific contact resistivities of the cases where the p-electrodes consisting of Rh, Rh/Pt, Rh/Ru,

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or Rh/Au were formed on the n-type nitride semiconductor, as shown in FIG. 1. Values are given in the ratio relative to the value when only Rh is used for the electrode in contact with the p-type ~~nitrate~~ nitride semiconductor layer, which is set to 1. Decline in the specific contact resistivity is seen in the electrode having Rh as the first layer and Ir as the second layer. Decline in the specific contact resistivity is also seen in the electrode having Rh as the first layer and Au as the second layer. However, it is unfavorable for the LED of the nitride semiconductor system because Rh forms an alloy with Au and increases absorption of light having a shorter wavelength.